REMARKS/ARGUMENTS

In the Office Action mailed August 6, 2009, claims 1 and 3-14 were rejected. In response, Applicants hereby request reconsideration of the application in view of the amendments ant the below-provided remarks. No claims are canceled.

For reference, claims 5 and 12 are amended. In particular, claim 5 is amended to recite the source region is at the first major surface over the body region. Claim 2 is amended to correct a grammatical error. These amendments are supported by the original language of the claims, as well as the subject matter described in the specification of the present application.

Also, claim 15 is added to recite the trench extends through the source region, the body region, and the drift region toward the drain region, without entering the drain region. These amendments are supported, for example, by the subject matter illustrated in Fig. 1 and the corresponding description provided in the specification.

Claim Rejections under 35 U.S.C. 103

Claims 1, 6-15, 17-21, and 25-30 were rejected under 35 U.S.C. 103(a) as being unpatentable over Fujishima (U.S. Pat. No. 5,981,996, hereinafter Fujishima) in view of Kocon (EP 1054451, hereinafter Kocon). However, Applicants respectfully submit that these claims are patentable over Fujishima and Kocon for the reasons provided below.

Independent Claim 1

Applicants assert that claim 1 is patentable over the combination of Fujishima and Kocon because the combination of cited references does not teach all of the limitations of the claim. Claim 1 recites:

> An insulated gate field effect transistor, comprising:
> a source region of a first conductivity type;
> a body region of a second conductivity type opposite to the first conductivity type adjacent to the source region;
> a drift region of exclusively the first conductivity type adjacent to the body region;
> a drain region of the first conductivity type adjacent to the drift region, so that body and drift regions are arranged between the source and

drain regions, the drain region being of higher doping density than the drift region, and wherein the region between the body region and the drain region is made up of exclusively the drift region of exclusively the first conductivity type; and

insulated trenches extending from the source region through the body region and into the drift region, each trench having sidewalls, and including an insulator on the sidewalls, and a conductive gate electrode between the insulating sidewall,

wherein the base of each trench is filled with an insulator plug adjacent to substantially all of the length of the drift region between the body region and drain region, and the respective gate electrode is provided in the trench over the plug adjacent to the source and body regions.

(Emphasis added.)

For reference, it should be noted that the several layers recited in the claim are of first and second conductivity types. Specifically, the source, drift, and drain regions are of the first conductivity type, and the body region is of the second conductivity type. Thus, the drift region is of the same conductivity type as the source and drain regions.

In contrast to the indicated language of the claim, the combination of Fujishima and Kocon does not teach all of the limitations of the claim because the combination of cited references does not teach the region between the body region and the drain region is made up of exclusively the drift region of exclusively the first conductivity type. In other words, the combination of Fujishima and Kocon do not teach the region between the body region and the drain region is made up of exclusively the drift region of the same conductivity type as the body and drain regions.

It should be noted that the reasoning in the Office Action recognizes that Fujishima does not teach the indicated language of the claim. Hence, the reasoning in the Office Action relies solely on Kocon as purportedly teaching the region between the body region and the drain region is made up of exclusively the drift region of exclusively the first conductivity type. For clarification, it appears that the reasoning in the Office Action relies on the P-Well region 207 and the Extended P-Zone region 212 of Kocon as purportedly being a drift region as recited in the claims of the present application.

However, even if the P-Well region 207 and the Extended P-Zone region 212 of Kocon were construed as a drift region, within the context of the present application, Kocon nevertheless fails to teach the indicated language of the claim because the P-Well

region 207 and the Extended P-Zone region 212 between the body region (P+ body 110) and the drain region (N-Drain Zone 108 and N+ substrate – Drain 216) of Kocon are of a different conductivity type than the source region (N+ Source 111) and the drain region (N- Drain Zone 108 and N+ substrate – Drain 216). Thus, the indicated P-Well region 207 and the Extended P-Zone region 212 are of a different conductivity type than the N+ Source region 111 and the N- Drain Zone 108/N+ substrate – Drain region 216. Alternatively, even if the described conduction types were reversed (N for P and P for N), the resulting N well region and Extended N-Zone region nevertheless would be of a different conductivity type than the resulting P Source and the P Drain regions. Therefore, Kocon does not does not teach the region between the body region and the drain region is made up of exclusively the drift region of exclusively the first conductivity type, which is the same as the conductivity type of the source region and the drain region.

Therefore, the combination of Fujishima and Kocon does not teach all of the limitations of the claim at least because Kocon does not teach a region between a body region and a drain region is made up of exclusively a drift region of exclusively a first conductivity type, as recited in the claim. Accordingly, Applicants respectfully assert claim 1 is patentable over the combination of Fujishima and Kocon because the combination of cited references does not teach all of the limitations of the claim.

Dependent Claims

Claims 3-14 depend from and incorporate all of the limitations of independent claim 1. Applicants respectfully assert claims 3-14 are allowable based on an allowable base claim. Additionally, each of claims 3-14 may be allowable for further reasons, as described below.

Dependent Claim 13

Applicants assert that claim 13 is patentable over the combination of Fujishima and Kocon because the combination of cited references does not teach all of the limitations of the claim. Claim 13 recites:

> An insulated gate field effect transistor according to claim 12 wherein the non-uniform doping concentration in the drift region is linearly graded from the higher doping concentration adjacent to the drain region to the lower doping concentration adjacent to the body region.
> (Emphasis added.)

In contrast to the indicated limitation, the combination of Fujishima and Kocon does not teach a linearly graded non-uniform doping concentration in the drift region. To the extent that the doping concentration of Fujishima or Kocon might be non-uniform, there is no discussion in Fujishima or Kocon of such non-uniformity following a linear grading. The Office Action states:

> With respect to claim 13 Fujishima describes an insulated gate field effect transistor according to claim 12 wherein the non-uniform doping concentration in the drift region is linearly graded from the higher doping concentration adjacent to the drain region to the lower doping concentration adjacent to the body region..(it is inherent that the portion of the drift region in figs., e.g., Fujishima fig.1 at a higher level "i.e. adjacent drift region have higher doping concentration than the portion of the drift region at a lower level will have lower concentration i.e. linearly graded adjacent to the drain region 109, see also response to applications arguments ection below Kocon paras 0020, 0024, claims 2,3 etc.).
> Office Action, 8/6/09, page 5 (underlining added, sic all.)

While the statements in the Office Action appear to refer to various teachings of Fujishima and Kocon, none of the cited portions of Fujishima or Kocon addresses a linearly graded non-uniform doping concentration of the drift region. Moreover, the mere presence of different doping concentrations does not necessitate a linearly graded doping concentration. Rather, the variations between doping concentrations at different levels may be graded in many ways, including many ways that are non-linear. Additionally, the newly cited references of Kocon also fail to address a linearly graded doping concentration. Therefore, none of the cited portions of Fujishima or Kocon teaches a linearly graded non-uniform doping concentration of the drift region. Therefore, the combination of Fujishima and Kocon does not teach all of the limitations of the claim because the combination of cited references does not teach a linearly graded non-uniform doping concentration of the drift region, as recited in the claim. Accordingly, Applicants respectfully submit claim 13 is patentable over the combination

of Fujishima and Kocon because the combination of cited references does not teach all of the limitations of the claim.

CONCLUSION

Applicants respectfully request reconsideration of the claims in view of the amendments and the remarks made herein. A notice of allowance is earnestly solicited.

At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account **50-4019** pursuant to 37 C.F.R. 1.25. Additionally, please charge any fees to Deposit Account **50-4019** under 37 C.F.R. 1.16, 1.17, 1.19, 1.20 and 1.21.

Respectfully submitted,

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